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Author(s): Mondragon, Krystal L.

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AMPP NEWSLETTER

SEP 2020

A MESSAGE FROM STACY MCLAUGHLIN, DIVISION LEADER

I am excited to introduce the third 2020 issue of Actinide Materials Processing and Power Division's quarterly newsletter, with a focus on "excellence in mission operations." Excellence in mission operations requires the execution of sustained operations that are reliable and responsive to mission needs across all work being performed in AMPP. For all of us, adherence to Conduct of Operations principles and strong work planning and execution is essential to achieving a safe and productive environment that enables overall excellence. Since the beginning of the COVID-19 pandemic response, you have all shown how AMPP has a division exemplifies this focus area. Highlights of our outstanding operational work under the threat of COVID-19 have been featured in our weekly newsletters.

Here are a few highlights:

- After the Hot Press 1 catastrophically failed in March, the integrated team across AMPP, TA55-PMDS, and PT successfully corrected the issue and verified operability through a surrogate press. The system reacted as expected and the press was successful. AMPP-1 has re-starting pellet pressing with three completed to date.
- The AQCL team has removed nearly 1 kg of SNM from the waste stream.
- AMPP-3 resumed ARIES operations and has completed their revised production milestone of 100kgs of oxide packaged.
- FY 20 Heat Source Production has shown great results, including: completed 20 batches (2.5 kgs) of fuel through aqueous processing, enough fuel to support 300 HSFAs; completed 10 batches of fuel through the fuel fabrication, enough fuel for 220 HSFAs; welded 173 HSFA liners, the initial encapsulation layer for HSFAs; 112 HSFAs diamond stamped in FY20.
- In June, personnel from AMPP-3 and PMDS safely removed a large set of used augers and tubes from a 100 area glovebox line by bagging out to a drum via a gloveport. This was a first-time hot evolution.
- AMPP-3 quickly found a workable solution to move items to the vault and resolved a significant issue that could have held up inventory in NDA.
- The Oxide Processing and Characterization Team, along with support from the Pu Conversion, Muffle Furnace, Packaging and NDA Teams from AMPP-3 were able to move two blend lots in order to take a significant step toward meeting the ARIES Oxide milestone, all without the cross-town trolley!
- The first HEU part burn in over three years started Tuesday, August 11.
- Beginning in early July, the Aqueous Nitrate team has provided off-shift and weekend support for the trolley repair efforts including resolving a construction-caused PPD, intro and installation of motors.

Now that AMPP has embraced the "new normal," we will continue to share AMPP's achievements through a short monthly newsletter and through our more detailed quarterly. With the reduction of in-person meetings, the opportunities to meet some of our newer AMPP employees has been reduced. We have included this as a new feature in this newsletter. When you do have to opportunity please welcome your newer colleagues.

Finally, I would like to thank all you for your patience and persistence over the past few months as we figure out together how to work safely and productively in the environment where COVID-19 provides an additional, significant hazard. Our work at the Laboratory and in ALDWP is critical to the nation. Despite the challenges of COVID-19, we have continued to deliver on our national security missions while keeping our workforce safe and healthy. I know this is not easy. Hang in there—we will get through this together!

Stacy McLaughlin
AMPP Division Leader

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EMPLOYEE SPOTLIGHT: KENT KRAMER

Kent Kramer has been at LANL for nearly 18 years. Kent started at the Lab as a mechanical technician for PMT-9, and currently works as an engineering technologist 3. He assembles radioisotope thermoelectric generators (RTGs) for the Defense Program as a member of AMPP-1.

Prior to LANL, Kent spent more than a decade working at Rocky Flats in Colorado. Between the two sites, he has nearly 30 years in his national security career.

When he's not at work, you can often find Kent working on his 1937 Dodge Pickup or riding his Can-Am Spyder, which he's put 75,000 miles on since he bought it in 2014. In fact, you may be surprised to find out that he's in his third year as President of the Spyder Ryders of America—Road Runners Chapter in Albuquerque!

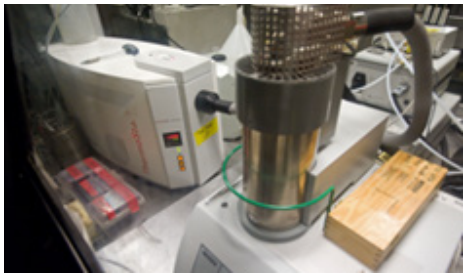
One of Kent's highlights of his job is working for a unique national security program, "I find it fascinating that the group I work for makes items for both NASA and the Department of Defense." He offers each of us a strong reminder that no matter our day job here in AMPP, we're working for a great and special cause.

Cold Testing of LIBS for Characterization of Oxide Feed Impurities

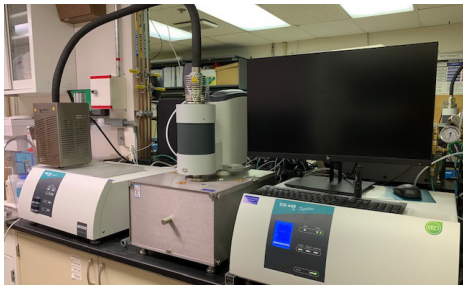
by Ann Schake, Enriquez Chacon, Jared Stritzinger

The ARIES Program converts surplus plutonium (Pu) metal components into an oxide powder form and packages the material for final disposition. Over a metric ton of surplus Pu has been removed from the nuclear weapons stockpile since 1998 and packaged for long-term storage. The ARIES oxide product must meet several material and packaging specifications before being shipped for final disposition. Samples are provided to the ARIES Characterization team before each lot is packaged, for the following analyses: Particle Size Analysis; Thermal Gravimetric Analysis – Mass Spectrometry (TGA-MS) for moisture content determination; Surface Area determination; Bulk and Tapped density determination; and destructive chemical analysis to determine elemental contaminant concentrations.

The oxide production rate for the ARIES Program is anticipated to increase substantially over the next decade in support of new production goals. In addition to the increased production rate, the program is transitioning from producing oxide certified for use in Mixed Oxide Fuel (MOX) production, to a Dilute and Dispose disposition path.



Above: 15 year-old TGA-MS that has been removed from GB for installation of new TGA-MS; shown below being cold tested.



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Cold Testing of LIBS, continued...

The dilute and dispose project involves "down blending" the weapons-grade Pu oxide, making it undesirable for weapons production, for final disposition at the Waste Isolation Pilot Plant (WIPP).

These changes in production goals are being met head on by the ARIES characterization team. A new particle size analyzer was installed in 2018, and a new TGA-MS is anticipated to be installed and ready for production analysis in PF4 later this year (Figure 1), replacing a fifteen-year-old instrument. To ensure all instruments will meet the production requirements in a glovebox environment, they are put through rigorous cold testing in the ARIES Characterization Cold Labs.

Data from the 80+ lots produced to date consistently shows low levels of elemental contaminants in the product oxide between the lots. However, it is expected that the changes in Pu product specification induced by a different pit mix, and the processing of Alternate (non-Pit Pu) Feed Stock (AFS) metals, will increase the level and types of contaminants. In particular, gallium (Ga) and beryllium (Be) contaminant levels are expected to increase substantially, along with a higher salt content. This higher salt content will increase the amount of the Cl- (chloride) and F- (fluoride) anions and their counter ions (e.g. Na+, K+, Mg2+, Ca2+).

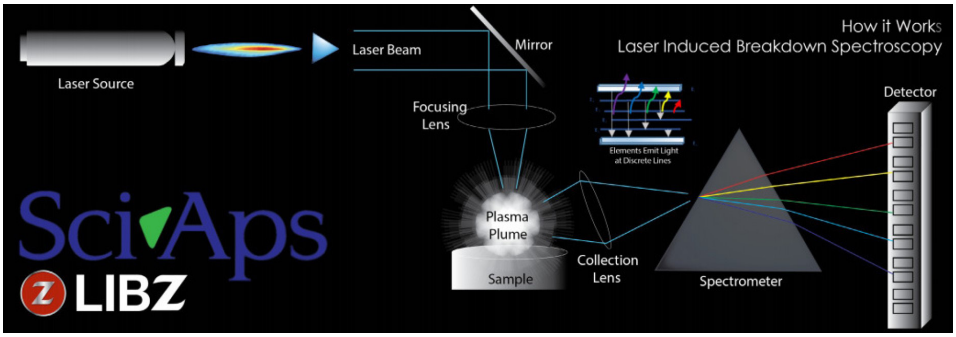
Concerns have also been raised over potential increases in RCRA metals in the oxide product. This unique feed creates a need for fast and efficient measurements to monitor elemental impurities in the oxide, allowing ARIES to identify and adapt to changes in lot characteristics, while maintaining process control.

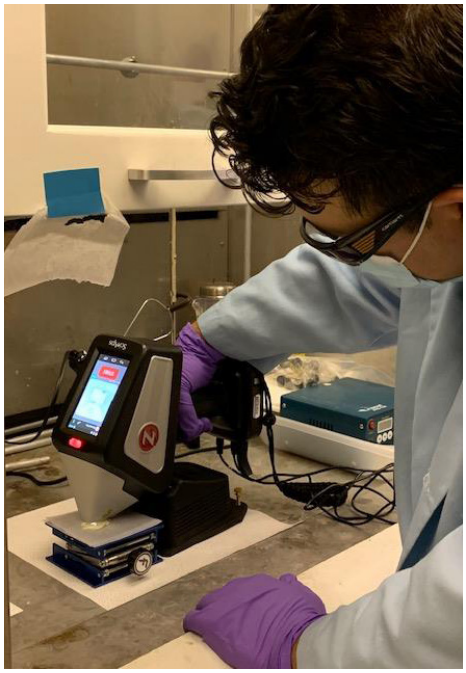
Full elemental characterization of oxides through destructive, analytical chemistry methods typically requires several weeks to months before data is reported, and often with large uncertainties, limiting the usefulness of the data. The Characterization Team is developing and evaluating new methods for the rapid quantification of impurities at the current and anticipated levels in the Pu oxide product. Elemental standards have been prepared in a Pu surrogate (Bismuth oxide, Bi2O3) matrix in the ARIES Characterization Cold Labs. These standards will be used to test the feasibility of employing real time spectroscopic methods for the analysis of the Pu oxide products. Once the standards are completely characterized and the calibrations complete, experiments to identify interferences in the spectroscopic data amongst the elements and the matrix will be performed on select mixtures of the top priority contaminants (e.g. Ga, Be, Fe, Cr, N, C, Cl). Data collected during the cold testing of surrogate materials and mixtures will provide the technical basis for the quantification of elemental contaminants in plutonium oxide products in PF4.

The first spectroscopic method being investigated is Laser Induced Breakdown Spectroscopy (LIBS), a type of atomic optical emission spectroscopy (OES), Figure 2. LIBS is based on the principles that each element emits unique colors of light. The wavelength (or color) of specific emissions reveals the element present, and the intensity of the light at that wavelength is related to the concentration of each element. Once installed in PF4 and incorporated into the characterization process flow, the ARIES Program will have rapid turnaround and in-house elemental analysis capabilities, ensuring the ability to fulfill their important mission.

Right: Enriquez Chacon collecting data using the SciAps Hand-Held LIBS instrument

Below: a schematic illustrating the first three steps of LIBS sample analysis: 1) plasma generation, 2) light emission, 3) light collection.





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CONTINUOUS IMPROVEMENT TOOLS WORKSHOP

What is 5S?

- A five step process used to create a visual workplace that results in leaner and more efficient processes.
- Starts with the cleaning and organization of a work space, but it also builds in the controls that keep the space permanently clean and efficient.

An organized workplace can have a major impact on productivity!

Why do 5S?

- Improved effectiveness – Less waste when work area is organized
- Promotes teamwork
  - Let's people share jobs
  - Less borrowing of needed tools
- First impressions
  - Customers and job seekers all judge your work area
- Reduced stress
  - Less stress trying to find things
  - Less irritation when things disappear

5S can improve productivity by 15% and it is strongly tied to the concept of visual management and the creation of a visual workplace.

See the "Current State"

- Prior to conducting a 5S, document the current state by taking pictures! This is a great way to "remember" how bad it was before 5S!
- Involve people that use the space in the 5S effort. Otherwise, it might be difficult to gain buy-in after the fact.
  - Determine what space you will be investigating
  - Involve people in the area (they own it)
  - Do an audit of any safety or waste
  - Take pictures of the current state
  - Post the current state pictures to capture the baseline condition

"Culture is created by what is tolerated and promoted."

- Dr. Henry Cloud

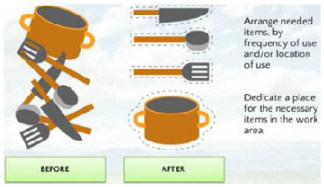
SORT

- Organization – Keep only what is necessary and discard everything else. A place for everything and everything in its place!
  - This phase generally results in comments like, "but I MIGHT need that!" but a little research can establish the reality of the last time any particular item was used.

When in doubt, move it out!

SET IN ORDER

- Orderliness – Arrange and label only necessary items for quick retrieval and storage by anyone
- Arrange needed items by location and frequency of use.



This approach is very important, especially for high traffic areas with multiple users!

SHINE

- Cleanliness – Keep everything swept and clean.
  - Turn the workplace into a clean place where everyone will enjoy working
  - SHINE should not be an annual activity – it should happen on a regular interval (before breaks, daily 5S, etc.)

Everything is clean and in working order.

STANDARDIZE

- Formalize the cleaning process to maintain (audits, forms, checklists, schedule of responsibilities) the first three S's: SORT, SET IN ORDER & SHINE.
- To apply STANDARDIZE, you must define:
  - Who is responsible for each area
  - What items go where
  - How often to sweep, remove files, clean, organize, and update
  - And what to do if things are not as expected

Guidelines and practices to maintain the first three steps.

SUSTAIN

- Maintain and review standards
- Without Sustain, the other 5's will not last long.
  - Build the right behaviors and build good habits. Otherwise, things tend to go back to the way they were.
- Some kind of auditing and enforcement is key to sustaining 5S.
  - How will leadership enforce 5S?
  - What will the consequences be if 5S is not kept up?

Ensure 5S becomes a habit that people practice (Daily 5S)

SAFETY

- Upon completing the first 5 steps of 6S, review the workspace and ensure it is free from hazards/motion that could cause harm to employees.
  - Height and weight of items on shelves
  - Blind spots when getting items above eye level.
  - Weight limits on items to be used/moved
  - Encourages appropriate ergonomic techniques

Ensure the work space is free from hazards/motion that may cause harm to the individual

5S Checklist

5S Office Assessment

Work Area: Robbie's office — Key: Use sheet to rate work area 5 times (note each date) 1 = "non-existent", 3 = "average" and 5 = "excellent"

5S Phase	Definition	Standards To Be Met	Ratings					Next Steps
		Date of Assessment	8/23					
Sort (Seiri)	The right materials are available and anything unnecessary is removed	- No unused items are stored	1					Need to eliminate clutter on desk. Remove unneeded documents, files
		- No unneeded materials, forms or supplies	1					
		- There are no out-of-date posters on the wall	5					
		- Excess supplies are reallocated	4					
Set in Order (Seiton)	There is place for everything and everything is in its place	- It's clear where working vs archive files belong	4					
		- The shared drive is easy to navigate	4					
		- Signage & naming conventions are clear	4					
		- Equipment and supply areas are clearly labeled	4					
Shine (Seiso)	Everything is clean and in working order	- IT conducts regular maintenance	5					
		- Licenses are renewed and updated on schedule	5					
		- Systems suffer minimal downtime	5					
		- Employees have access to the right applications	4					
Standardize (Seiketsu)	Guidelines and practices are established to maintain first three steps	- 5S activities and locations are clearly outlined	3					
		- Audit forms and checklists exist	1					No visual management for clear guidance on how to locate items
		- There is a 5S schedule & responsibilities are clear	1					
		- Quantities and limits are clearly marked	3					
Sustain (Shitsuke)	5S is a habit that people incorporate into their daily practice	- Leadership enforces 5S habits	1					No direction or guidance in this area
		- There is accountability for ongoing 6S practices	1					
		- 5S results are prominently displayed	1					
		- Employees are recognized for 5S practice	1					
		Total Score	56	0	0	0	0	

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MEET AMPP'S NEWEST EMPLOYEES AND LEARN A FUN FACT ABOUT THEM!

AMPP-1

Loren Miller
Assembly & Testing

"During my free time, I enjoy getting buckets!"

Kyle Thompson
Assembly & Testing

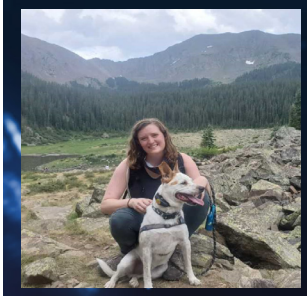
"My biggest pet peeve is when someone has the windshield wipers running too fast for the conditions."

Ryan Bermel
Hydroxide & Processing Aqueous R&D

Likes whitewater paddling, skiing, and music festivals

Jerry Wilmoth
Hydroxide Processing & Aqueous R&D

"I played golf on scholarship in college with the V.P. and General Manager that runs Bristol Speedway, a NASCAR track in Bristol, TN."



Kayla Jo Gill
Metallography, Surveillance & Characterization

"I've hiked the Grand Canyon!"

Jonathan Poindexter
Welding

Likes to hike and rock climb

AMPP-3

Rene Zamora
Pu Conversion,
Muffle Team

"I am a Graduate from the Cockrell School of Engineering from the University of Texas at Austin. AKA a Longhorn, Hook'em Horns!

Adrian Bazan-Grine
Logistics Team

"I enjoy hunting and fishing."

Rachel Nelson
Pu Conversion, DMO Team

"I absolutely adore dogs!"

Kenneth Gomez
Logistics Team

"I enjoy hiking with my wife and two dogs in my free time."

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WELCOME TO AMPP'S NEW EMPLOYEES!

AMPP-3

Jose Terrazas
Pit Disassembly Team

"I enjoy working on my cars and attending car shows."

Patrick Tapia
Logistics Team

"I'm a father of two and an avid hunter."

Dennis Duran
Logistics Team

"I enjoy hunting and being in the outdoors."

Alberto Gomez
Logistics Team

"I am very easy going and pretty relaxed most of the time."

Kenneth Hernandez
Logistics Team

"I have 20 years experience as an overhead electrical distribution power lineman/ journeyman."

David Chavez
Characterization Team

"I'm a musician; I can play guitar, drums, bass, and also sing."

Mike Workman
Packaging Team

"I was a substance abuse and domestic violence intervention counselor before I went back to school for my science and engineering degrees."

David Lemon
Pu Conversion, DMO Team

"I'm a history lover, and have enjoyed expanding my knowledge of the Lab's history since I started working here."

Erin Giron, Jr.
Characterization Team

"I am a nationall licensed EMT who enjoys helping my community."

David Martinez
Oxide Processing Team

"My favorite band is AFI."

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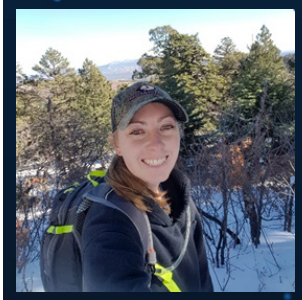
WELCOME TO AMPP'S NEW EMPLOYEES!

AMPP-4

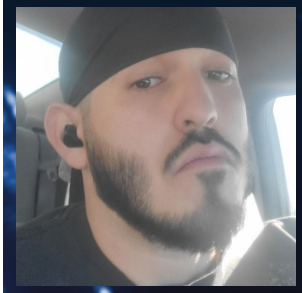
Jackie Dorhout
Scientist

"I started at LANL as a GRA in 2014. I have recently developed an intolerance to garlic and onions, which makes going out to eat an adventure!"



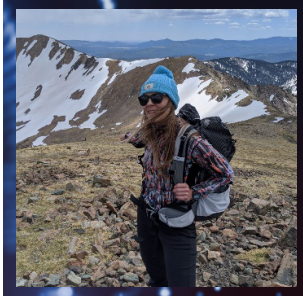
Bridget DeLanoy
Technician

"I love the great outdoors - I do a lot of hiking, snowboarding, kayaking, mountain biking and I just put a small lift on my Grand Cherokee to go more places!



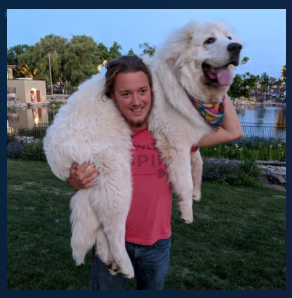
Anthony Garcia
Technician

"I've been enlisted in the military for 5 years. I frequent building computers and playing games. My comforts are being with my lady and watching movies with the kids."



Izabela Kruk
Scientist

"I love hiking! And my last meal on Earth would be pecan waffles."



James Bunsen
R&D Engineer

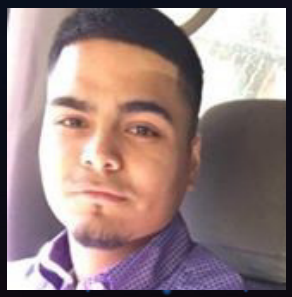
"I am designing and building my own house in the Jemez Mountains and I am an Eagle Scout and volunteer with a local troop."

Joel Christensen
Technician

"I was an Arabic Linguist and SIGINT analyst/operator in the Marines, and I have been to 12 countries."

Justin Watson
Technician

"I love fitness, nutrition, and golf… and I'm terrible at all of them. I have lived in 5 states (Ohio, Kentucky, Texas, California, New Mexico)."



Leroy Aguilar
Technician

"On my days off, I like to go for drives in the Jemez Mountains and enjoy the time there with my family. A hobby of mine that keeps me busy is my project truck that I am currently restoring."

Welcome also to these new employees who will be featured in our next newsletter!

Jonathan Rascon
Characterization Team

Justin Varela
Technician

Garrett Fulcher
Technician

Mike Molina
Technician

Joshua Ortiz
Technician

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Congrats!

LANL SERVICE ANNIVERSARIES

Kenneth Hansel, AMPP-3 - 15 years
Paul DeBurgomaster, AMPP-1 - 10 years

DISTINGUISHED PERFORMANCE AWARD RECIPIENTS

Heat Source Final Assembly (HSFA) Team
Solvent Extraction Team

Meet the AMPP Division Administrative and Professional Staff!

Our AMPP administrative team is the first point of contact to assist you with any administrative, business, or operational needs!
Back Row (L-R): Monica Pacheco (AMPP-3), Tina Varela (AMPP-4), Marty Leal (AMPP-4), Elizabeth Vigil (AMPP-DO), Briana Lujan (AMPP-3)
Front Row (L-R): Rebekah Archuleta (AMPP-1), Krystal Mondragon (AMPP-DO), Kianna Leseberg (AMPP-1)

Have questions about Virgin Pulse?

The Virgin Pulse program gives you the tools to get active and live a healthy lifestyle. Earn rewards by making healthy decisions. The more you make, the more you earn! Earn up to $100 HCA deposit for PPO plans and $250 HSA deposit for HDHP plans.

New hires: please contact Marty to get your Virgin Pulse account started!

Reminder!

Mobile devices — including those owned by the Laboratory and the U.S. government — banned from Limited Areas including behind the fence starting Sept. 30. Start practicing now!